



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/937,204	12/13/2001	Bernard Fritig	A34638-PCT USA	6438
21003	7590	10/21/2003	EXAMINER	
BAKER & BOTTS 30 ROCKEFELLER PLAZA NEW YORK, NY 10112			IBRAHIM, MEDINA AHMED	
			ART UNIT	PAPER NUMBER
			1638	

DATE MAILED: 10/21/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/937,204	FRITIG ET AL.	
	Examiner	Art Unit	
	Medina A Ibrahim	1638	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 July 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 6-16, 24-28 and 31-43 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 6-12, 14-16, 24-28, 31-36 and 38-43 is/are rejected.
- 7) ☐ Claim(s) 13 and 37 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____. | 6) <input type="checkbox"/> Other: _____. |

DETAILED ACTION

1. Misnumbered claims 34 (the second) to 42 have been renumbered as 35-43 as per Rule 1.126. All future correspondences should refer to the new numbers.

Election/Restrictions

2. Applicant's election without traverse of Group I, claims 1-16 and 24-32, filed 07/28/03 is acknowledged. The restriction requirement is made FINAL.

Claims 1-5, 17-23 and 29-30 have been cancelled. New claims 33-43 have been added. Therefore, claims 6-16, 24-28 and 31-43 are pending and are under examination.

Specification

3. The following guidelines illustrate the preferred layout for the specification of a utility application. These guidelines are suggested for the applicant's use.

Arrangement of the Specification

As provided in 37 CFR 1.77(b), the specification of a utility application should include the following sections in order. Each of the lettered items should appear in upper case, without underlining or bold type, as a section heading. If no text follows the section heading, the phrase "Not Applicable" should follow the section heading:

- (a) TITLE OF THE INVENTION.
- (b) CROSS-REFERENCE TO RELATED APPLICATIONS. See 37 CFR 1.78 and MPEP § 201.11.
- (c) STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT. See MPEP § 310.
- (d) INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON A COMPACT DISC (See 37 CFR 1.52(e)(5) and MPEP 608.05. Computer program listings (37 CFR 1.96(c)), "Sequence Listings" (37 CFR 1.821(c)), and tables having more than 50 pages of text are permitted to be submitted on compact discs.) Or

REFERENCE TO A "MICROFICHE APPENDIX" (See MPEP § 608.05(a).
"Microfiche Appendices" were accepted by the Office until March 1, 2001.)
See 37 CFR 1.52(e) and MPEP § 608.05

(e) BACKGROUND OF THE INVENTION. See MPEP § 608.01(c).

(1) Field of the Invention.

(2) Description of Related Art including information disclosed under 37
CFR 1.97 and 1.98.

(f) BRIEF SUMMARY OF THE INVENTION. See MPEP § 608.01(d).

(g) BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S).

(h) DETAILED DESCRIPTION OF THE INVENTION.

(i) CLAIM OR CLAIMS (commencing on a separate sheet).

(j) ABSTRACT OF THE DISCLOSURE (commencing on a separate sheet).

(k) SEQUENCE LISTING (See MPEP § 2424 and 37 CFR 1.821-1.825. A
"Sequence Listing" is required on paper if the application discloses a
nucleotide or amino acid sequence as defined in 37 CFR 1.821(a) and if
the required "Sequence Listing" is not submitted as an electronic
document on compact disc).

The specification is specifically objected to for its omission of part (g). A
reference to and brief description of the drawing(s) as set forth in 37 CFR 1.74 are
required. See MPEP § 608.01(f).

Sequence Listing

4. This application contains sequence disclosures that are encompassed by the
definitions for nucleotide and/or amino acid sequences set forth in 37 CFR 1.821(a)(1)
and (a)(2). However, this application fails to comply with the requirements of 37 CFR
1.821 through 1.825 for the reason(s) set forth on the attached Notice To Comply With
Requirements For Patent Applications Containing Nucleotide Sequence And/Or Amino
Acid Sequence Disclosures.

The sequence Listing filed 05/01/02 has been entered. However, the sequences
on page 6, lines 1, 4, 11-12 and 25, and page 56, line 10, have not been identified by
SEQ ID NO: Applicant is respectfully requested to identify the sequences presented on
pages 6 and 56 or to submit a new Sequence Listing which comprises said sequences.

Applicant is also required to amend the specification to include the SEQ ID NO: for said sequences.

Claim Objections

5. Claim 37 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

6. Claims 6-7, 10-13, 15-16 and 24 are objected to because of the following:

Claim 6 is objected to in the recitation of "class II o-methyltransferase (COMT II)" because "class II o-methyltransferase" and "COMT II are not interchangeable.

Appropriate correction is required. Also, "COMT should be spelled out.

Claim 7 is objected to because "COMT II promoter comprises nucleic acids_u upstream" implies that the promoter comprises more than one sequence. It is suggested that "nucleic acids" be replaced with ---a sequence---. In addition, "the transcription and the expression" is redundant because expression encompasses transcription and translation. Appropriate correction is required.

In claims 10-11 and 39-40, "3' end of a promoter" is not an art recognized phrase. Appropriate correction is required.

In claim 12, "and" in line 5 should be changed to ---or---, for proper Markush terminology. Also, " nucleic acid comprises nucleic acids_u " implies that the promoter comprises more than one sequence. It is suggested that "nucleic acids" be replaced with ---a sequence---.

In claim 13, "said nucleic acid comprises nucleotides 557 and 1796 of SEQ ID NO: 1" implies that the nucleic acid comprises only 2 nucleotides. It is suggested that -- the sequence between nucleotides--- be inserted before "nucleotides".

In claim 15, "encoded by said nucleic encoding a protein which is functional in plant cells" in line 3, and "which is functional in plant cells" in line 4, are redundant. The phrases should be deleted.

In claim 16, "which is functional in plant cells" is redundant. The phrase should be deleted.

In claim 28, "obtained using" in line 2, should be replaced with ----produced by---, for clarification.

7. Claims 28, 31-32 and 41-43 are improper multiple dependent claims because they depend upon another multiple dependent claim 14.

Claim Rejections - 35 USC § 112

8. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

9. Claims 6-7 and 12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

A broad range or limitation together with a narrow range or limitation that falls within the broad range or limitation (in the same claim) is considered indefinite, since the resulting claim does not clearly set forth the metes and bounds of the patent protection desired. Note the explanation given by the Board of Patent Appeals and

Interferences in *Ex parte Wu*, 10 USPQ2d 2031, 2033 (Bd. Pat. App. & Inter. 1989), as to where broad language is followed by "such as" and then narrow language. The Board stated that this can render a claim indefinite by raising a question or doubt as to whether the feature introduced by such language is (a) merely exemplary of the remainder of the claim, and therefore not required, or (b) a required feature of the claims. Note also, for example, the decisions of *Ex parte Steigewald*, 131 USPQ 74 (Bd. App. 1961); *Ex parte Hall*, 83 USPQ 38 (Bd. App. 1948); and *Ex parte Hasche*, 86 USPQ 481 (Bd. App. 1949). In the present instance, claim 6 recites the broad recitation class II o-methyltransferase, and the claim also recites COMT II (caffeic acid o-methyltransferase), which is the narrower statement of the range/limitation.

In claim 7, "the tobacco COMT II gene" implies that there is only one tobacco COMT II gene. However, according to page 22 of the specification (Example 1), tobacco plant contains more than one COMT II genes. It is unknown which gene is being referred to, since all COMT II genes are inducible (see Pellegrini et al 1993 (Applicant's IDS), at least the Abstract). Appropriate correction to more clearly define the metes and bounds of the claim is required.

Claim 12 is indefinite in the recitation of "capable of hybridizing selectively" which is not clearly defined in the specification. In the absence of specific wash and hybridization conditions, one would not know what is encompassed by the claim.

Claim Rejections - 35 USC § 101

10. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claim 32 is rejected under 35 U.S.C. 101 because the claimed invention is directed to a non-statutory subject matter. The claim does not read, "transformed grain", and therefore the claim reads on the product of nature. Due to chimerism, not all of the cells from a transgenic plant will comprise in their genome the transgene. Amendment to the claim to read ---transformed grain--- would obviate the rejection.

Claim Rejections - 35 USC § 112

11. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

12. Claims 6, 14-16, 24-28, 31-32 and 41-43 are rejected under 35 U.S.C. 112, **first paragraph**, because the specification, while being enabling for the isolated promoter sequence of SEQ ID NO: 1, a chimeric gene comprising said promoter operably linked to a protein encoding sequence, plant cells and plants transformed with chimeric gene, and a method of transforming plant cells with said chimeric gene, does not reasonably provide enablement for any inducible class II o-methyltransferase gene promoter or any COMTII gene promoter from any dicot plant, a chimeric gene, plant cells and plant comprising said promoter, and a method of transforming plant cells with said chimeric gene. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention commensurate in scope with these claims.

Applicant broadly claims a nucleic acid comprising any inducible class II o-methyltransferase including any COMT II gene promoter from any dicotyledonous plant,

a chimeric gene comprising said promoter operably linked to a nucleic acid encoding a protein which confers resistance to disease or insects to plant cells, a vector, and plant cells/plants comprising said nucleic acid and grains from said plants. The claims are also drawn to a method for transforming plant cells with said chimeric gene.

Applicant provides guidance for the isolation of an inducible gene promoter from a tobacco genomic library prepared from leaves inoculated with the Tobacco Mosaic Virus, TMV (Example I, SEQ ID NO: 1). Applicant also provides guidance for the nonspecific and specific promoter elements such as the TATA box and the CAT box, boxes P, A, E, L and W in SEQ ID NO: 1 which are responsible for the initiation of transcription and the response to stresses such as pathogen elicitors and UV rays (Example 2). Applicant teaches functional and deletion analysis of the promoter regions of SEQ ID NO: 1 by stably expressing GUS gene under the control of various fragments of SEQ ID NO: 1 in transgenic plants (Example 3). GUS activity in these plants was assayed under various stress conditions (Tables 1-8). The results on tables 1 and 2 show that at least 1239 bp of SEQ ID NO: 1 is required in order to allow the induction and strong expression of the GUS gene. Applicant further teaches transgenic tobacco with high level of resistance against fungal and viral pathogens as a result expressing antifungal and antiviral polypeptides under the control of SEQ ID NO: 1 (Example 4).

Applicant has not provided guidance for other class II o-methyltransferase gene promoters including COMT II gene promoters from other dicot plants, and there is no indication that any has been isolated from plants before Applicant's invention. Because plant class II O-methyltransferase genes, including the class II caffeic acid O-

methyltransferase (COMT II), exist in a multigene family composing of several genes with certain structural differences (see page 22 of the specification), it unpredictable as to whether the disclosed method is also applicable for the isolation of other inducible class II o-methyltransferase and COMT II gene promoters from all dicot plants.

Neither the instant specification nor that the prior art provides evidence that class II o-methyltransferase including COMTII gene promoters are conserved among dicot plants. Absent significant guidance with regard to hybridization/wash conditions and/or PCR conditions that will allow specific isolation of the target promoters, undue trial and error experimentation would be required to screen through the vast number of genomic clones from tobacco and other dicot plants, to identify the desired promoters. Undue experimentation would also be required to evaluate the ability of said promoters to affect expression of structural genes, especially disease and insect resistance genes in transgenic plants.

The state of the prior art, as exemplified by Kim et al (Plant Molecular Biology, vol. 24, pp. 105-117, 1994(U)) teach the extreme sensitivity of promoter regions to single base pair changes, the absolute requirement for as few as 3 to 6 nucleotides for promoter function, and the failure of a promoter to function either constitutively or specifically when lacking oligonucleotide regions approximately 100 bp upstream of the transcription start site (page 106, paragraph bridging the columns; paragraph bridging pages 107 and 108; page 110, paragraph bridging the columns).

The working examples disclosed in the specification are limited to SEQ ID NO: 1 and fragments thereof having promoter activity. While Applicant is not required to

exemplify each and every claimed embodiment, the scope of enablement must bear a "reasonable correlation" to the scope of the claims. See, e.g., *In re Fisher*, 427 F.2d 833, 839, 166 USPQ 18, 24 CCPA 1970.

Therefore, given the lack of guidance as discussed supra; the breadth of the claims; the unpredictability inherent in promoter functionality; the limited working examples; the state of the prior art; the level of knowledge and skill in the art, the claimed invention is not enabled throughout the broad scope. See, *In re Wands* (858F.2d 731, 8 USPQ2d 1400 (Fed. Cir. 1988)).

See also, *Amgen Inc. Chugai Pharmaceutical Co. Ltd.*, 18 USPQ 2d 1016 at 1021 and 1027 (Fed. Cir. 1991) at page 1021, where it is taught that a gene or a promoter is not reduced to practice until the inventor can define it by its "physical or chemical properties" (e.g. a DNA sequence).

Written Description

13. Claims 6-12, 14-16, 24-28, 31-36 and 38-43 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The claims are broadly drawn to nucleic acids comprising inducible class II o-methyltransferase gene promoters including COMT II gene promoters from any dicotyledonous plant, as well as tobacco COMTII promoters comprising more than 600, 1000, 1200, and 1800 nucleotides upstream of the COMT II gene ATG site. The claims

are also drawn to tobacco COMT II promoters comprising a transcription initiation site located less than 100 nucleotides upstream of the ATG, and with 3' end located between 10 and 50 nucleotides downstream of the transcription initiation site, said nucleic acids capable of hybridizing selectively to SEQ ID NO: 1, or homologous to SEQ ID NO: 1. The claims are further drawn to chimeric genes, vectors, plant cells and plants comprising said nucleic acids, and grains from said plants, and a method of transforming plant cells with said nucleic acids. In contrast, Applicant only describes the isolated nucleic acid sequence of SEQ ID NO: 1 from tobacco, chimeric genes, vectors, plant cells and plants comprising said nucleic acid. These are genus claims

University of California v. Eli Lilly and Co. 43 USPQ2d 1398 (Fed. Cir. 1997) states "A description of a genus of cDNA may be achieved by means of a recitation of a representative number of cDNAs, defined by nucleotide sequence, falling within the scope of the genus or of a recitation of structural features common to members of the genus, which features constitute a substantial portion of the genus. See also where the court teaches that the disclosure of a process for obtaining cDNA from a particular organism and the description of the encoded protein fail to provide an adequate written description of the actual cDNA from the organism which would encode the protein from that organism, despite the disclosure of a cDNA encoding that protein from another organism.

Applicant has not described a promoter sequence other than SEQ ID NO: 1. Applicant has not described the composition or structure of other class II o-methyltransferase gene promoters including COMT II gene promoters from other

dicotyledonous plants. Applicant has not described all tobacco COMT II gene promoters having the structural properties as recited in claims 8-12, 34-36 and 38-40. Applicant has not described a single variant from tobacco that selectively hybridizes or homologous (as defined on pages 9 and 10 of the specification) to SEQ ID NO: 1 and retaining COMTII promoter activity. Therefore, Applicant has not described a representative species of the genus of the claims. Further, one skilled in the art would not expect that the majority of nucleic acids of claims 8-11, 34-36 and 38-40 will have COMT II promoter activity because the results on Tables 1 and 2 (pages 26 and 27 of the specification) show that a sequence of at least 1239 bp comprising specific promoter elements is required for effective inducibility and promoter activity. Therefore, given the lack of adequate written description for the nucleic acids as broadly claimed, chimeric genes, vectors, plant cells and plants comprising said promoters and methods of transforming plants with said promoters are similarly not described. Therefore, the specification fails to sufficiently describe the claimed invention in such full, clear, concise, and exact terms that one skilled in the art would recognize that Applicants are in possession of the invention as broadly claimed.

Accordingly, in view of all the above, the claimed invention lacks adequate written description as required under the current written description guidelines (See Written Description Requirement published in Federal Registry/Vol.66, No. 4/Friday, January 5, 2001/Notices; P. 1099-1111).

Remarks

Art Unit: 1638

14. The claims are deemed free of the prior art, given the failure of the prior art to teach or reasonably suggest an isolated nucleic acid comprising an inducible class II O-methyltransferase or COMTII gene promoter from a dicot plant, a chimeric gene, a vector, plant cells and plants comprising said nucleic acid, nor that the prior art teaches a method of transforming plant cells with said nucleic acid.

15. No Claim is allowed.

16. Papers related to this application may be submitted to Technology Sector 1 by facsimile transmission. Papers should be faxed to Crystal Mall 1, Art Unit 1638, using fax number (703) 308-4242. All Technology Sector 1 fax machines are available to receive transmission 24 hrs/day, 7 days/wk. Please note that the faxing of such papers must conform with the Notice published in the Official Gazette, 1096 OG 30 (November 15, 1989).

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Medina A. Ibrahim whose telephone number is (703) 306-5822. The Examiner can normally be reached Monday-Thursday from 8:30AM to 5:30PM and every other Friday from 9:00AM to 5:00PM.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Dr. Amy Nelson, can be reached at (703) 306-3218.

Any inquiry of a general nature or relating to the status of this application should be directed to the receptionist whose telephone number is (703) 308-0196.

10/17/03

Mai

